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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,669	08/05/2003	Koji Shimazawa	116794	5316
25944	7590	01/10/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			BERNATZ, KEVIN M	
			ART UNIT	PAPER NUMBER
			1773	

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/633,669

Applicant(s)

SHIMAZAWA ET AL.

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/5/03 + 11/26/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Kamijo (U.S. Patent No. 6,819,532 B2).

Regarding claim 1, Kamijo discloses an exchange-coupled film in which an antiferromagnetic (AFM) layer (*Figure 6, layer 32*) and a ferromagnetic layer sandwich (*layers 33a, 33b, 34 and 35*) are stacked and in which a direction of magnetization of the ferromagnetic sandwich is pinned (*e.g. layers 33a, 33b are the "pinned" magnetic layers; col. 12, line 43 bridging col. 13, line 22*), wherein said ferromagnetic layer sandwich comprises a first ferromagnetic layer containing a ferromagnetic material of the body-centered cubic structure (*layer 33b*), and a pair of second ferromagnetic layers containing a ferromagnetic material of the face-centered cubic structure and formed on respective sides of the first ferromagnetic layer (*layer 33a and 35; col. 9, lines 35 – 51; and col. 19, lines 27 - 42*), and wherein said AFM layer contains a disordered alloy (*col.*

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10, lines 28 – 35) and is kept in contact with one of said second ferromagnetic layers (Figure 6 – elements 32 and 33a).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiguchi et al. (U.S. Patent App. No. 2002/0051380 A1) in view of Mizuguchi (U.S. Patent No. 6,287,709 B1).

Regarding claim 1, Kamiguchi et al. disclose an exchange-coupled film in which an antiferromagnetic (AFM) layer (Figure 14, layer A) and a ferromagnetic layer sandwich (layer P) are stacked and in which a direction of magnetization of the ferromagnetic sandwich is pinned (e.g. layer P is the “pinned” magnetic layer and Paragraph 0087), wherein said ferromagnetic layer sandwich comprises a first ferromagnetic layer containing a ferromagnetic material of the body-centered cubic (bcc) structure (e.g. layer PF2 and Paragraphs 0140 - 0151), and a pair of second ferromagnetic layers containing a ferromagnetic material of the face-centered cubic (fcc) structure and formed on respective sides of the first ferromagnetic layer (e.g. PF1 and Paragraphs 0140 - 0151), and wherein said AFM layer is kept in contact with one of said second ferromagnetic layers (Figure 6 – elements 32 and 33a). While Kamiguchi

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et al. does not explicitly disclose using the fcc layer as PF1 and the bcc layer as PF2, the Examiner notes that since Kamiguchi et al. explicitly mentions using both fcc and bcc layers, that such an embodiment would have been readily envisioned by one of ordinary skill.

Kamiguchi et al. fail to disclose the AFM layer being a disordered alloy.

However, the Examiner deems that disordered AFM layers and ordered AFM layers are known equivalents in the field of pinning layers, as taught by Mizuguchi (*col. 4, lines 27 – 34 and Figure 4*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, ordered and disordered AFM layers are equivalents in the field of AFM pinning layers for exchange coupled films. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Regarding claims 2 and 3, Kamiguchi et al. disclose nonmagnetic conductive layers (*Figure 14, element S*) and free ferromagnetic layers (*element F*) meeting applicants' claimed structural limitations.

Regarding claim 4, 7 and 8, the Examiner notes that the apparatus limitations are nominal head/recording apparatus limitations, as taught by Kamiguchi et al. (*Figure 14, elements EL*) and Mizuguchi (*col. 3, lines 36 – 45*).

Regarding claims 5 and 6, the Examiner notes that CiP (e.g. claim 5) and CPP (e.g. claim 6) head structures are nominal head structures wherein the only significant difference is the location of the electrodes to cause the flow of electrons to either be in

the plane of the film (*claim 5*) or perpendicular to the plane of the film (*claim 6*).

Kamiguchi et al. teach that both embodiments are known (*Paragraphs 0014 – 0032 and Figures*).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Soeya et al. (JP 2002-074626 A) teach an exchange coupled structure comprising a substrate/AFM layer/fcc ferromagnetic layer and a bcc ferromagnetic layer, wherein an additional fcc ferromagnetic layer can be placed above the bcc ferromagnetic layer opposite a non-magnetic layer (*Figures and Paragraphs 0032 - 0034*), though Soeya et al. fail to teach using a disordered alloy as the AFM layer.

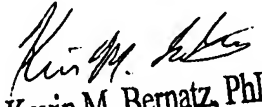
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
January 6, 2005


Kevin M. Bernatz, PhD
Primary Examiner